MAPET

INPUT

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March 19, 1992

Ms. Judy Steel
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Dear Ms. Steel:

Thank you for your participation several months ago in INPUT's research on education and training applications. The results of the research have been published in a report, *Cross-Industry Markets, 1991-1996: Education and Training Sector* which is part of INPUT's Market Analysis Program.

Enclosed is a complementary copy of the report. If you have any questions, please do not hesitate to call.

Sincerely,

C. Frances Borison

C. Frances Borison
Senior Consultant

CFB:bf

Enclosure

MAPET LTR LABELS.

Education and Training Cross-Industry Sector--~~Executive Summaries~~

white report

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not and distributed yet.

Market
Analysis
Program
(MAP)

Cross-Industry Markets 1991-1996

Education and Training Sector

Forecast Update

INPUT®

1280 Villa Street, Mountain View, CA 94041, (415) 961-3300

FEBRUARY 1992

CROSS-INDUSTRY MARKETS 1991-1996

EDUCATION AND TRAINING SECTOR

FORECAST UPDATE

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Education and Training Sector
Forecast Update

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I

Introduction

I

Introduction

The education and training cross-industry sector report is written each year by INPUT as one of seven reports on cross-industry sectors of the U.S. information services industry. The seven cross-industry sectors are:

1. Engineering and Scientific
2. Accounting
3. Human Resources
4. Planning and Analysis
5. Education and Training
6. Office Systems
7. Other Cross-Industry

These reports are included as part of INPUT's Market Analysis Program (MAP), a planning service for information services vendors.

A
Purpose and Organization

1. Purpose

The objectives of this forecast update are to:

- Identify the business and technological issues and trends that are driving the use of information services within this cross-industry sector
- Forecast user expenditures during the next five years on information services for the education and training cross-industry sector
- Discuss the competitive environment and profile leading vendors in the education and training cross-industry sector

Emphasis is on updating INPUT's 1990 forecast and forecast assumptions for the education and training cross-industry sector, and assessing what has changed in the forces impacting this market over the last 12 months.

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A discussion of recent competitive events, such as significant product announcements and/or acquisitions, is also included.

The report provides readers with insights and information that will help them:

- Review the forces shaping the market
- Develop internal corporate financial projections
- Identify new markets and product and services opportunities
- Assess the competitive trends
- Determine potential market directions
- Prioritize investments

2. Organization

This report consists of three chapters and two appendixes. The report is organized as follows:

- Chapter I—Introduction—introduces and defines the education and training cross-industry sector and the information services delivery modes to be forecasted

- Chapter II—Information Services Market—presents information services user expenditure forecasts by delivery mode and submode for the education and training cross-industry sector

- Chapter III—Competitive Environment—provides synopses of competitive events that have occurred over the last 12 months, and vendor profiles

- Appendix A—Forecast Data Base—gives a detailed forecast by delivery mode and submode for the education and training cross-industry sector. It contains a reconciliation to the previous year's forecast.

- Appendix B—Definitions—defines cross-industry sector and information services terms used in this report. For all information services industry definitions, the reader is referred to INPUT's *Definition of Terms* found in the overview binder of the Market Analysis Program.

B
Description of Education and Training Cross-Industry Sector

This report addresses the U.S. information services industry for the education and training cross-industry sector.

INPUT defines cross-industry information services as packaged functional information services that are used by multiple industry sectors. In other words, these information services are not verticalized. For example,

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accounting, and planning and analysis are functions that are similar enough across all industries to be considered markets in their own right for nonverticalized application solutions.

Cross-industry information services are delivered via applications software products, turnkey systems and transaction processing services. Management support information services such as systems operations, systems integration and professional services, information delivery services and systems software are excluded from cross-industry consideration.

Thus the education and training cross-industry sector encompasses computer-based training (CBT) products only. Training that is provided live, in a classroom setting, is not considered in this report.

CBT is not limited to training about IS subjects. Initially, CBT focused on technical subjects. The education and training cross-industry sector now includes CBT on any subject and for any classification of employee. Examples of major application areas are sales/marketing, health awareness and basic skills/adult literacy, as well as machine and mechanical technologies, industrial maintenance, diesel and automotive, and engineering technologies. Authoring systems and courseware are included in this sector. Authoring systems provide a toolkit or shell for courseware development.

C
Related Reports

Related reports of possible interest to the reader include:

1. U.S. Markets

- *Cross-Industry Market Reports*
  - Accounting Sector, 1991-1996
  - Human Resources Sector, 1991-1996
  - Engineering and Scientific Sector, 1991-1996
  - Planning and Analysis Sector, 1991-1996
  - Education and Training Sector, 1991-1996
  - Office Systems Sector, 1991-1996
- *U.S. Application Solutions Market, 1991-1996*
- *U.S. Processing Services Market, 1991-1996*
- *U.S. Industry Sector Reports, 1991-1996* (15 reports on all major industry sectors, e.g., insurance)

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2. European Markets

- *The Western European Market for Computer Software and Services, 1991-1996*
- *Trends in Processing Services—Western Europe, 1991-1996*

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II

Information Services Market

II

Information Services Market

This chapter presents user expenditure forecasts for education and training cross-industry information services by delivery mode. Assumptions driving the forecasts are provided.

Section A—Overview— discusses the overall size and growth rate of user expenditures. Section B—Delivery Mode Analysis—breaks out this same forecast into INPUT's delivery modes. The delivery modes that are applicable to cross-industry sectors are:

- Applications software products
- Transaction processing services
- Turnkey systems

The following five delivery modes are not included in this cross-industry report:

- Network services
- Systems software
- Systems integration
- Systems operations
- Professional services

In addition, utility processing services and other processing services are excluded. These seven areas are discussed in several of INPUT's delivery mode reports.

A
Overview

INPUT estimates user expenditures on cross-industry CBT—both on technical and remedial subjects—to be $519 million in 1991. They will grow to $919 million by 1996. This represents a compound annual growth rate (CAGR) of 12% (Exhibit II-1). This CAGR is the same as INPUT's education and training (CBT) forecast last year.

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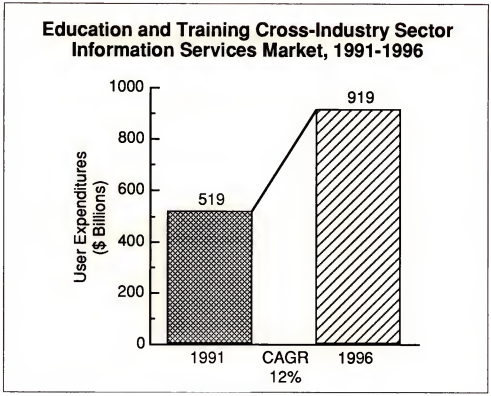
EXHIBIT II-1



In contrast, the education and training portion of professional services is forecast to grow from $2.7 billion to $4.5 billion in 1996, a CAGR of 11%. This forecast is part of INPUT's *U.S. Professional Services Market, 1991-1996* report. Other kinds of remedial or job-specific, instructor-led training is outside the scope of either report.

Generally speaking, CBT is still a relatively small market. It is, however, gaining more widespread recognition. More off-the-shelf courseware is available now and a whole "industry" of CBT consulting services has sprung up that was not apparent last year.

- The need for inexpensive and efficient training methods is the key driver. Various vendors and CBT consultants have conducted productivity studies that show the combined cost of CBT license fees, computer resources, personnel support and presentation systems to be lower than instructor-led training. Obviously there are many variables, but as more studies are conducted that convincingly show CBT advantages, growth will be promoted.

  One of the important variables is the type of training requirement. Where instructors are needed most is in the "people-to-people" areas of training. If the subject matter can be written down, will remain fairly constant, and a large number of people need to know it, CBT will work well. If, on the other hand, it requires group discussion and practice of "people skills," instructor-led training is required.

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- Because many of the skills required on the job—from specific task-related skills to managerial skills—are simply not taught in schools, responsibility for training increasingly rests upon corporations.

  - According to the U.S. Labor Department, between 1985 and 2000, 38% of the pool of 21- to 25-year-old new entrants to the workforce will be required to read and write at high competency levels; only 5% will have the needed skills.

  - The average entrant will not be as well educated, yet will need to use more complex information systems. A great deal of opportunity exists for computer-based training on technologies and products such as new operating systems, networking, client/server architectures, object-oriented programming and applications development. A constant need exists for a broader base of knowledge in order to more effectively use new as well as existing computer technologies.

On the other hand, a number of forces will inhibit growth of CBT during the next several years:

- A number of authoring systems have appeared. Authorware Professional is a prime example. But the market for authoring systems has been slow to take off. One reason for the lack of acceptance has been the small installed base of more powerful personal computers with high memory capacity, and the expense of CD players and color monitors. And, although a great deal of progress has been made, authoring tools are still difficult to use.

- Multimedia instruction is bogged down due to lack of affordable hardware. Also, it is currently limited to a single workstation. Multimedia instruction needs to be digitized across a network in order to obtain widespread use.

- In addition, performance support is just beginning to catch on. The goal of a performance support system is to provide whatever is necessary to generate performance and learning at the moment of need. At present, performance support systems are limited by the technological difficulty in developing them. Only a few companies have software tools for performance support.

- The economic slump is having a mixed impact on CBT. As users continue to seek less expensive forms of training, they will investigate CBT. On the other hand, if there is any hesitancy about buying something new and unproven—as CBT is for first-time users—this hesitancy is magnified during a recessionary period. Although disk-based CBT is relatively inexpensive, authoring systems and multimedia are still considered expensive.

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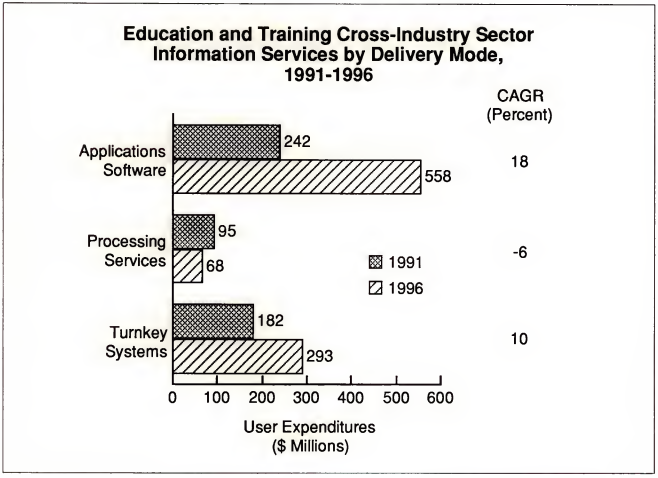
B
Delivery Mode Analysis

As can be seen from the forecast presented in Exhibit II-2, expenditures for education and training applications software products will experience healthy growth over the next five years. However, expenditures on turnkey systems will be moderate and processing services expenditures are declining.

EXHIBIT II-2



Following is a discussion of each of the individual delivery mode forecasts.

1. Applications Software Products

INPUT's estimate of the 1991 applications software products market by hardware platform for the education and training cross-industry sector is presented in Exhibit II-3.

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EXHIBIT II-3

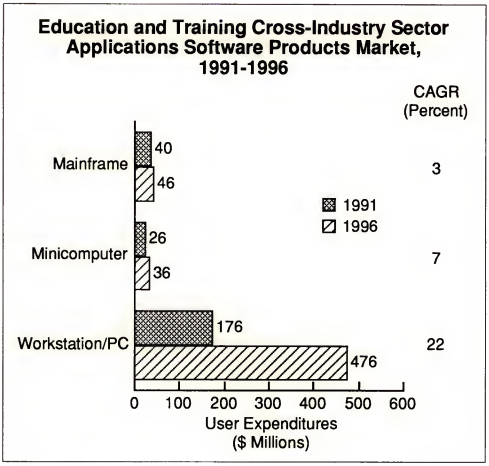

Exhibit II-3 reflects the following:

- Although mainframes have traditionally been the largest CBT delivery mode, they have been surpassed by microcomputers. Initially, for example, all Crwth and Goal Systems CBT products were mainframe-based. The transition of individualized instruction from host-based systems to standalone PCs, and then to networked personal computer-based systems will continue during the 1991 to 1996 time period.

- PC-based applications software products will experience the fastest growth, rising at a 22% CAGR through 1996. This is the same growth rate that INPUT forecast last year.

- In addition to the growth promoters mentioned previously, what will specifically promote the growth of this delivery mode is the introduction of more generic, shell application packages that can be customized by the end user.

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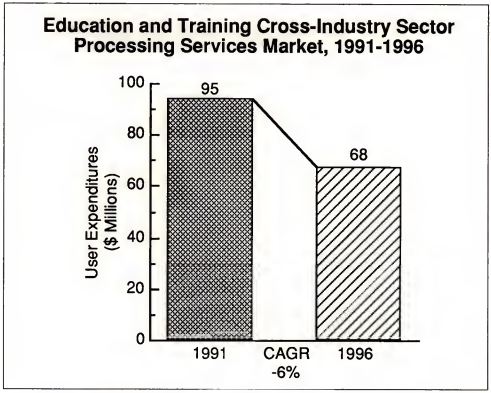
2. Processing Services

Exhibit II-4 presents INPUT's education and training processing services forecast. This forecast is considerably lower than the eight percent CAGR forecast for the total U.S. processing services market.

EXHIBIT II-4



This segment consists of a reservoir of Plato users, but it will continue to decline rapidly due to the availability of CBT on personal computers. Mainframe-based Plato was the first interactive training system and was developed by Control Data Corp. As indicated in Exhibit II-4, INPUT forecasts this delivery mode to decline from user expenditures of $95 million in 1991 to $68 million in 1996.

3. Turnkey Systems

Exhibit II-5 is INPUT's forecast for computer-based training delivered via turnkey systems.

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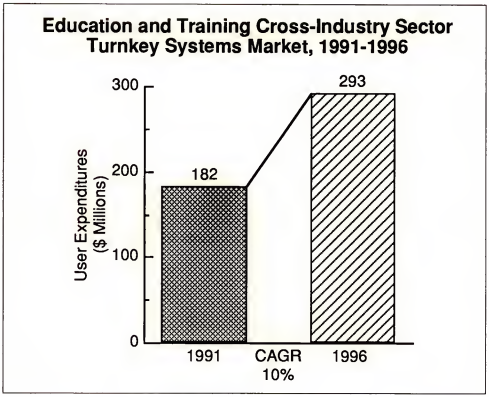
EXHIBIT II-5



Turnkey CBT solutions are experiencing healthier growth than the turnkey systems market overall. Vendors are providing turnkey solutions that incorporate third-party video disks and CD ROMs as well as the computer platform and applications software. Unlike other cross-industry turnkey systems that are most frequently used by smaller firms, in the case of CBT turnkey systems are used by large firms as well.

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III

Competitive Environment

III

Competitive Environment

This section discusses the competitive environment for information services within the education and training cross-industry sector. Key trends are discussed. Leading vendors are identified and selected vendors are profiled.

A
Vendor Characteristics and Trends

Types of companies that compete in this sector are:

- Companies that provide full-service training solutions including class instruction, written materials, video tapes, and computer-based training on a variety of technical and academic subjects for public and private schools, business and government.
- Smaller companies that provide specific CBT solutions to a range of customer types or a single industry.
- Companies that provide software-only education and training for specific products such as Word for Windows or Lotus 1-2-3.
- Companies that provide CBT on sales management and customer service. Learning International is an example of a firm in this area.
- Authoring system vendors.

Most education and training vendors are vertically specialized and therefore are not represented in this report. Other vendors that are represented in this report sell authoring systems and consulting services to assist end users in developing their own specialized materials. In many instances, cross-industry solutions represent only a small portion of their overall training offerings.

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Vendor trends include:

- Vendors are introducing CBT about using client/server, object-oriented programming, CASE and UNIX. The more traditional CBT vendors will have to become more technologically astute in order to upgrade their offerings or they will be forced out by newer, more savvy vendors.

- Although adult literacy and general education courseware used in industry is still a small part of the overall cross-industry education and training market, we are beginning to see an increase in this type of CBT tailored to specific business needs. For example Josten's, a leader in K-12 courseware, is beginning to package general education courseware for business needs.

- Although far from widespread development and implementation, more vendors are beginning to develop multimedia instruction—both in academic education and industrial training—and there is more experimentation with performance support systems.

- The competitive landscape will change over the next several years as startup companies enter the multimedia market. There is a risk that these smaller companies will be underfunded.

- As on-line documentation catches on and as multimedia instruction progresses, vendors that participate in the education and training cross-industry market may ultimately be competing against electronic publishing firms—such as Interleaf and Frame Technology—as well as CAD vendors. These three sets of vendors are all experimenting with multimedia; electronic publishing is seeking new uses for on-line "view only" products.

- Historically, CBT vendors sold technology courseware to IS centers. As customers outsource and downsize their applications software products—and as technology moves out to end users—vendors will have to change their marketing and selling strategies to reach a broader market.

- As the market becomes more competitive and CBT becomes more common, high quality and low price will play more of a role in vendor and product selection. Easy customization and strong service and support will become increasingly important.

B

Leading and Emerging Vendors

Dozens of companies—possibly as many as one hundred—sell cross-industry CBT. Leading vendors are listed in Exhibit III-1.

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EXHIBIT III-1

Education and Training Cross-Industry Sector Leading Vendors

Authoring Software

- Authorware, Inc.
- Computer Teaching Corp. (TenCORE)
- Amtech
- Quest/Allen Communications

Technology Courseware

- Crwth Computer Courseware (division of Science Research Associates)
- National Education Training (formerly Applied Learning International)
- Goal Systems

Remediation/General Business

- Josten's Learning
- Wicat
- Computer Curriculum Corp.
- Roach Organization
- Learning International

For many of the companies that compete in this cross-industry sector, CBT is but one education and training delivery mode. For example, Learning International provides traditional seminars, videos, workbooks and trainers; only about one percent of revenue comes from CBT.

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C
Vendor Profiles

This section contains profiles of a sampling of vendors showing the diversity of types of companies and approaches.

1. American Training International (ATI), 12638 Beatrice Street, Los Angeles, CA 90066, (213) 823-1129

ATI was formed in 1981 to provide custom training to large organizations. The company redirected its efforts to become a leading publisher of third-party training and assessment programs for personal computer software users.

The company's catalog currently lists over 75 titles under three product categories:

- "Teach Yourself..." training programs for the most popular word processing, data base, spreadsheet and integrated programs, operating systems, and training materials for LAN applications.
- "Teach Me..." tutorials designed for the mass merchandising market.
- In 1990, ATI introduced computer-skills testing programs. Similar to typing or shorthand tests administered to clerical personnel, ATI's Certify! testing programs provide an objective assessment of a user's skill level on a given software program.

ATI programs are available for DOS, OS/2, Apple Macintosh and UNIX environments.

2. Authorware, Inc., 275 Shoreline Drive, Suite 535, Redwood City, CA 94065, (415) 593-3101

Authorware is a good example of a relatively new company that develops and markets software for interactive learning and communication. The company was formed in 1987 by a former Control Data Corporation executive who was instrumental in the development of the Plato system.

Its flagship product, Authorware Professional, is a multimedia authoring software product that runs on the Apple Macintosh and Windows 3.0 platforms. Authorware Star is the company's first "personal" authoring product.

Authorware Professional is used by individual corporate users to develop their own custom-designed interactive learning products. It is also used by commercial developers who build consumer and mass market titles. In

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addition, in order to further develop its markets, Authorware's New Media Publishing Group develops and produces selected titles that leverage its strengths in the design of custom applications.

Authorware has a development alliance with IBM. The two companies will share core multimedia and authoring technologies and will jointly develop new multimedia products. Authorware also has distribution agreements with ASCII (Japan), NEC (Japan), Acer Corporation (Taiwan), and Silicon Graphics (U.S.). These companies will bundle Authorware Star with all of its media-capable computers.

Authorware strives for great ease of use by providing high levels of interactivity. An icon-based, object-oriented authoring environment—Object Authoring—allows nonprogrammers to develop applications without scripting. Data and files from other media-based creation and editing tools can be combined, and information from data bases can be imported/exported.

Authorware's software is used by major corporations, government agencies, educational institutions and leading publishers worldwide. Authorware's estimated 1991 revenues are $12 million.

3. Crwth Computer Courseware, 2850 Ocean Park Boulevard, Suite 200, Santa Monica, CA 90405, (213) 399-5300

Crwth, founded in 1981, develops and markets mainframe CBT to Fortune 1000 organizations throughout the United States and Canada. Crwth is a business unit of Science Research Associates (SRA). SRA develops and markets self-study training courses for IBM hardware and software, including AIX. Courses are text, video tape and PC-based simulation and exercises. SRA is a division of the MacMillan/McGraw-Hill School Publishing Company.

FORMAT Courseware is the company's flagship product. Courseware is also available under Goal System's PHOENIX EASE. Crwth recently acquired rights to market Computer Systems Research's client/server Enterprise curriculum. A challenge for Crwth will be to develop and/or acquire additional PC-based products and to incorporate some of the features, such as high-quality graphics, that PCs provide into its mainframe product line.

Crwth sells its CBT products to office systems, software product evaluation and end-user computing managers, as well as to accounting/finance departments.

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4. Digital Learning Systems, 102 Headquarters Plaza North, 11th Floor, Morristown, NJ 07960, (201) 538-6640

Digital Learning Systems, Inc. (DLS), founded in 1982, develops training and orientation software programs that run on IBM's PC products and compatibles. DLS also offers disk-based advertising services and on-line reference books that it sells to sales/marketing departments of various companies and to microcomputer users requiring access to materials.

DLS products are distributed directly by IBM. DLS recently signed with Packard Bell, which now ships an interactive tutorial with each of its PC shipments.

Other DLS developments over the last year are:

- DLS has new versions of its Lotus 1-2-3 tutorial that also includes a tutorial for DOS.
- DLS developed the animated demonstrations of Lotus 1-2-3 Windows and DOS used in retail stores.
- IBM started shipping a significantly improved version of a DLS system tutorial with each of its PS/2 computers. The tutorial now includes a catalog chapter.
- DLS has expanded training and marketing into specific industries. For example, DLS is working with several pharmaceutical companies to put training and marketing materials on disk for the sales force.

The company also has a line of reference books on disk—KeyNotes Library—which is sold through retail computer stores such as Egghead. These products were upgraded in late 1990 and DLS is adding new titles to this library. The reference books are licensed from their original publishers.

5. Goal Systems International, 5455 N. High Street, Columbus, OH, 43214-1194 (614) 888-1775

Goal Systems' Information Technology Division is a major player in CBT and computer-based reference and associated courseware systems.

Its flagship products are Phoenix, a mainframe-based authoring and presentation system that now extends to IBM midrange and microcomputers; and Preference, a mainframe-based text reference tool. Goal Systems sells the generic courseware shell and the customer develops the specifics of the courseware.

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- A new product is Preference/Phoenix, a performance support system.

- Syllabus, which has been under development for 3 years and is now in beta testing, is a multimedia authoring system enabling clients to create their own training courseware in the four major GUI environments, Windows, OS/2 PM, UNIX (X-Windows) and Apple Macintosh. Its target market is the distributed, client/server environment.

- Explain is an on-line documentation and on-line help system. With the mainframe as the file server, it provides access to all types of reference text or manuals via PCs, LANs, UNIX workstations, and mainframe environments.

Goal continues its strategy of acquisition. In 1990 Goal acquired Teaching by Computer and its Syllabus product. This acquisition gives the company PC tools to complement its Phoenix and Preference employee performance support systems for mainframes.

In 1991, Goal broadened is technical capability for on-line documentation and help through its acquisition of Training America Inc. (White Plains, NY) and its Explain product. TAI revenues were in the $2 million range for the year ended June 30, 1991. More acquisitions are planned.

Goal's development efforts include smart interfaces and faster ways of getting information on-line. One of Goal's challenges is the integration of its new PC-based products with its flagship mainframe product line.

Although Goal Systems does not specifically target any vertical sector markets, many of its products are purchased by banks, insurance brokerage firms, utilities, and Fortune 500 companies.

Goal's Information Technology Division's worldwide revenue for calendar 1991 is in the $26 million range.

6. National Education Training Group, 1751 West Diehl Road, Naperville, IL 60563, (708) 369-3000

National Education Training Group (The Training Group)—formerly Applied Learning International—is a subsidiary of National Education Corporation (NEC). Its purpose is to provide training for information processing, technology management, end-user computing, and human resource development topics to industry and government markets. The Training Group's products include interactive video, CBT, and instructor-led and linear video instruction.

The company was formed in 1987 with the merger of the DELTAK Training Corporation and Advanced Systems, Inc. The Training Group recently reorganized into the following divisions in order to better serve its markets as well as to address opportunities for new technology training.

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- DELTAK sells products and services to IS centers.

- Human Resources Skills Division sells management, supervisory and personal development education and training materials to human resources departments.

- Industrial Skills Division sells skills-based courses to industrial and manufacturing entities. The Training Group has just recently begun to sell CBT to functional areas other than human resources.

- James Martin Insight—established in June 1991— develops training products on leading information technologies such as open systems, client/server, object-oriented programming and re-engineering. James Martin Insight is a partnership between The Training Group and James Martin & Associates.

The Training Group is working aggressively towards rounding out its product line and decreasing its dependence on mainframe hardware and software instruction. James Martin Insight has already released several products on application development techniques including two extensive products that are interactive.

The company derives 100% of its revenue from training and education to cross-industry markets. The Training Group is NEC's largest operation. Revenue for the parent company is in the $400 million range, and has been flat for the last several years. It is National Education Training's expectation that its new products—along with the reorganization—will boost sales to previous levels.

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Appendixes

A

Forecast Data Base

Appendix A-1 is the user expenditure forecast data base for the education and training cross-industry sector.

Appendix A-2 reconciles this year's forecast with INPUT's 1990 forecast. INPUT has adjusted its processing services and applications software products forecasts downward this year to reflect more conservative assumptions about these delivery modes in general.

EXHIBIT A-1

Education and Training Cross-Industry Sector
User Expenditure Forecast by Delivery Mode, 1990-1996
($ Millions)

Delivery Modes	1990 ($M)	Growth 90-91 (%)	1991 ($M)	1992 ($M)	1993 ($M)	1994 ($M)	1995 (M)	1996 ($M)	CAGR 91-96 (%)
Sector Total	473	10	519	569	631	715	823	919	12
Processing Services	95	0	95	89	83	78	73	68	-6
- Transaction Processing	95	0	95	89	83	78	73	68	-6
Turnkey Systems	170	7	182	196	213	239	275	293	10
- Equipment	82	7	87	94	102	115	132	141	10
- Software Products	61	7	66	71	77	86	99	105	10
- Applications	53	7	56	61	66	74	85	91	10
- Systems	9	7	9	10	11	12	14	15	10
- Professional Services	27	7	29	31	34	38	44	47	10
Applications Software Products	208	16	242	284	335	398	475	558	18
- Mainframe	38	5	40	41	42	43	44	46	3
- Minicomputer	24	8	26	28	30	32	34	36	7
- Workstation/PC	146	21	176	215	263	323	397	476	22

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EXHIBIT A-2

Education and Training Cross-Industry Sector
1991 MAP Data Base Reconciliation
($ Millions)

Delivery Modes	1990 Market				1995 Market				90-95 CAGR per data 90 Rpt (%)	90-95 CAGR per data 91 Rpt (%)
	1990 Report (Fcst) ($M)	1991 Report (Actual) ($M)	Variance from 1990 Report ($M)	Variance from 1990 Report (%)	1990 Report (Fcst) ($M)	1991 Report (Fcst) ($M)	Variance from 1990 Report ($M)	Variance from 1990 Report (%)		
Total	476	473	-3	-1	829	823	-6	-1	12	12
Processing Services	95	95	-	-	74	73	-1	-1	-5	-6
Turnkey Systems	171	170	-1	-1	275	275	-	-	10	10
Applications Software	210	208	-2	-1	480	475	-5	-1	18	18

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B

Definition of Terms

1. Cross-Industry Sector Definitions

INPUT has identified seven cross-industry—or horizontal—market sectors. These sectors or markets involve multi-industry applications such as human resource systems, accounting systems, etc. In order to be included in an industry sector, the service or product delivered must be specific to that sector only. If a service or product is used in more than one industry sector, it is counted as cross-industry.

The seven cross-industry markets are:

- Human Resources
- Education and Training
- Office Systems
- Accounting
- Engineering and Scientific
- Planning and Analysis
- Other (includes sales and marketing, and electronic publishing)

2. Delivery Mode Definitions

Cross-industry application solutions are delivered via applications software products, turnkey systems and transaction processing services. Management support information services such as systems operations, systems integration and professional services, information delivery services, and systems software are excluded from cross-industry consideration.

a. Applications Software Products

Applications software products enable a user or group of users to support an operational or administrative process within an organization. Examples include accounts payable, order entry, project management and office systems. INPUT categorizes applications software products into two submodes.

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- *Industry-Specific Applications Software Products* - Software products that perform functions related to fulfilling business or organizational needs unique to a specific (vertical) industry market and sold to that market only. Examples include demand deposit accounting, MRPII, medical records keeping, and automobile dealer parts inventory.

- *Cross-Industry Applications Software Products* - Software products that perform a specific function that is applicable to a wide range of industry sectors. Examples include payroll and human resource systems, accounting systems, word processing and graphics systems, and spreadsheets.

INPUT also forecasts the applications software products delivery mode by platform level: mainframe, minicomputer and workstation/PC.

b. Turnkey Systems

A turnkey system is an integration of equipment (CPU, peripherals, etc.), systems software, and packaged or custom applications software into a single product developed to meet a specific set of user requirements. Value added by the turnkey system vendor is primarily supplied by the software and support services. Many CAD/CAM systems and many small business systems are turnkey systems. Turnkey systems utilize standard computers and do not include specialized hardware such as word processors, cash registers, process control systems, or embedded computer systems for military applications.

Computer manufacturers (e.g., IBM or DEC) that combine software with their own general-purpose hardware are not classified by INPUT as turnkey vendors. Their software revenues are included in the appropriate software category.

Most turnkey systems are sold through channels known as value-added resellers.

- *Value-Added Reseller (VAR):* A VAR adds value to computer hardware and/or software and then resells it to an end user. The major value added is usually applications software for a vertical or cross-industry market, but also includes many of the other components of a turnkey systems solution such as professional services.

Turnkey systems have three components:

- *Equipment* - Computer hardware supplied as part of the turnkey system

- *Software products* - Prepackaged systems and applications software products

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- *Professional services* - Services to install or customize the system or train the user, and provided as part of the turnkey system sale

c. Processing Services

This delivery mode includes three submodes: transaction processing, utility processing, and "other" processing services.

- *Transaction Processing* - Client uses vendor-provided information systems—including hardware, software and/or data networks—at the vendor site or customer site to process transactions and update client data bases. Transactions may be entered in one of four modes:

  - *Interactive* - Characterized by the interaction of the user with the system for data entry, transaction processing, problem solving and report preparation; the user is on-line to the programs/files stored on the vendor's system.

  - *Remote Batch* - Where the user transmits batches of transaction data to the vendor's system, allowing the vendor to schedule job execution according to overall client priorities and resource requirements.

  - *Distributed Services* - Where users maintain portions of an application data base and enter or process some transaction data at their own site, while also being connected through communications networks to the vendor's central system for processing other parts of the application.

  - *Carry-in Batch* - Where users physically deliver work to a processing services vendor.

- *Utility Processing* - Vendor provides basic software tools (language compilers, assemblers, DBMSs, graphics packages, mathematical models, scientific library routines, etc.), generic applications programs and/or data bases, enabling clients to develop their own programs or process data on the vendor's system.

- *Other Processing Services* - Vendor provides service—usually at the vendor site—such as scanning and other data entry services, laser printing, computer output microfilm (COM), CD preparation and other data output services, backup and disaster recovery, etc.

For a more complete discussion of INPUT's information services industry structure and market sector definitions, please refer to INPUT's *Definition of Terms* found in the overview binder of the Market Analysis Program.

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